Small
Business
Innovation
Research

30-Percent Efficient, Tandem Solar Cells for Line-Focus Photovoltaic Array

JX Crystals Inc.
Issaquah, WA

INNOVATION

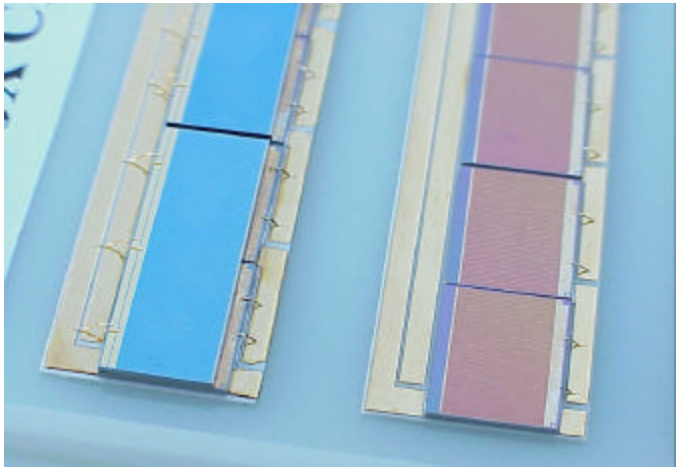
High performance photovoltaic (PV) receiver for use with line-focus solar concentrator arrays for efficient generation of power in space

ACCOMPLISHMENTS

- Demonstrated PV receiver for a line-focus refractive concentrator using mechanical stacking of photovoltaic cells
- Fabricated gallium-antimonide (GaSb) photovoltaic solar cells which are applicable for space and terrestrial thermophotovoltaic (TPV) systems

COMMERCIALIZATION

- This SBIR served as a major stepping-stone in receiving a Ballistic Missile Defense Organization (BMDO) 1997 SBIR managed by GRC (Contract NAS3-00122)
- Received Army SBIR, Army STTR and DARPA SBIR contracts for further work on GaSb thermophotovoltaic cells for terrestrial military applications
- Received two Department of Energy (DOE) contracts for terrestrial applications of the GaSb photovoltaic cell
- Received commercial contract for terrestrial market
- Company personnel increased from 3 to 15



Mechanically Stacked PV Cell Receiver Units
(Right, GaSB cells without top cells — Left, final product)

GOVERNMENT/SCIENCE APPLICATIONS

- Concept is applicable to a wide variety of NASA space missions (i.e. deep space, high radiation) with significant cost savings potential and increased performance
- Applicable to many military missions for space power generation and terrestrial stand-alone TPV systems
- GaSb cell is a key component for thermophotovoltaic power generation applications

Glenn Research Center
Space Power
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1992 Phase II, NAS3-27240, 5/01
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